SLIDING VISOR

TECHNICAL FIELD

The present invention relates to a visor, and more particularly to a sliding visor for use in a vehicle.

BACKGROUND OF THE INVENTION

The passenger compartments of vehicles are usually equipped with sun visors. The visors are mounted on pivot rods. The visors rotate downwardly from a stored position against the headliner of the vehicle to various lower positions for shielding the eyes of the occupants from sunlight. A torque control rotatably attaches the visor to the rod. The torque control must hold the visor at the various positions, yet permit relatively easy adjustment of the visor. Some of such visors are laterally adjustable along the rod for enhanced shielding effectiveness.

A number of such visors have been proposed; however, they are problematic. A number of visors use a metal extrusion in which to house the torque control. The torque control slides within the extrusion. This type of apparatus requires numerous parts and therefore is costly.

Yet another visor design utilizes a visor with a guide means and a torque control. The guide means includes a plurality of parallel rails, a plurality of disks and a coupling means. The rails extend longitudinally on one surface of the visor. The torque control is disposed on the rails. The torque control has a longitudinally extending slot herethrough. The plurality of disks contact the other side of the torque control. The coupling means fastens the disks to the core. The coupling means extends through the slot in the torque control. The engagement of the torque control with the rails and disks allows the visor to be moved with respect to the torque control. This apparatus requires numerous parts, and therefore is costly.

Another visor design utilizes a visor with a L-shaped arm which extends outwardly from one surface of the visor core. The rod extends longitudinally along the visor core. A separate panel includes two spaced L-shaped arms which extend outwardly from the surface of the panel. When assembled the L-shaped arm on the visor interlocks with the L-shaped arms on the panel, so that these parts are in sliding engagement with one another.

Therefore, a sliding visor is sought, which can be rotated from a stored position to a use position, and which can be moved longitudinally along the rod. It is desired that the visor be aesthetically pleasing, and have a relatively simple design.

SUMMARY

According to an embodiment of the present invention, a sliding sun visor assembly includes a rod assembly, and a visor body. The rod assembly includes a rod, torque control, and a guide. The visor body includes a bore and a track.

The rod is placed through the visor body bore and extends longitudinally into the visor body. The torque control pivotally attaches to the rod. The guide is fixed to one surface of the torque control.

The track extends longitudinally on one surface of the visor body. The track forms a substantially enclosed longitudinally extending passage adjacent the surface of the visor body. The passage is shaped to receive a portion of the guide in a sliding engagement. Upon moving the visor longitudinally along the rod, the track slides relative to the guide, which allows the visor to be used in an extended or retracted position.

In one embodiment, the guide has a substantially H-shaped cross section.

The foregoing invention will become more apparent in the following detailed description of the best mode for carrying out the invention and in the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWING

FIG. **1** is a fragmentary perspective view of a sun visor assembly embodying the present invention, the visor is in a lowered, extended position.

FIG. **2** is a front partial view of the visor assembly shown in FIG. **1**; the visor is in a lowered, retracted position with a cover removed for clarity.

FIG. **3** is a partial cross-sectional view along line **3**—**3** of FIG. **2** of a portion of the visor assembly.

FIG. **4** is a rear perspective view of a preferred embodiment of the torque control for use with the visor assembly of the present invention.

FIG. **5** is a cross-sectional view along line **5**—**5** in FIG. **4** of the torque control without a rod disposed therein.

FIG. **6** is a front partial view of the visor assembly shown in FIG. **2**, the visor is in a lowered, retracted position with the cover removed for clarity.

FIG. **7** is a front partial view of the visor assembly shown in FIG. **2**; the visor is in a lowered, extended position with the cover removed for clarity.

BEST MODE FOR CARRYING OUT AN EMBODIMENT THE INVENTION

Referring to FIG. **1**, a vehicle **10** includes a windshield **12** and a roof covered by a headliner **14** with an upholstered surface **16** to provide a trim appearance to the vehicle. The vehicle further includes an A-pillar **18** separating the windshield **12** and a side window **20**. A sliding sun visor assembly **22** is shown on the driver's side of the vehicle.

The sliding sun visor assembly **22** includes a pivot rod assembly **24**, and a visor body **26**. The pivot rod assembly mounts the visor body **26** to the roof of the vehicle. The visor body can have a number of positions. In the lowered, extended position, the visor is adjacent the side window **20** and spaced from the A-pillar **18**. As indicated by the arrow A, the visor body **26** can be moved from the extended position to the lowered, retracted position (as shown in FIG. **2**) adjacent the side window **20** and the A-pillar **18**. The visor body can be placed in a raised, stored position (not shown), where the visor is adjacent the headliner **14**.

Referring to FIGS. **1** and **2**, the pivot rod assembly **24** includes an elbow bracket **28**, a L-shaped pivot rod **30**, a torque control **32**, and a guide or shoe **34**. The elbow bracket **28** attaches to the roof of the vehicle and pivotally secures one end of the rod **30** to the vehicle.

The longitudinally extending pivot rod **30** includes a metal insert **36**, which is molded into a plastic cover **38**. The plastic cover **38** covers all but a portion of the metal insert **36**. The metal insert **36** includes a plurality of lobes and flats (not shown) for cooperating with the torque control **32**.

The end of the plastic cover **38** opposite the exposed portion of the metal insert includes a conical tower **40**. The conical tower **40** allows the rod **30** to be snapped into a conventional elbow bracket **28**.

The metal insert **36** may be formed from a low carbon steel, and can be extruded and bent. The flats and lobes (not shown) on the metal insert are formed using a coining process. The number of flats and lobes formed depends on

the torque control used. The plastic cover **38** is formed from nylon or glass-filled nylon and is injection molded with the metal insert therein.

Referring to FIG. **2**, the torque control **32** allows the visor body **26** to be moved between and held at various rotational positions with respect to the rod. The torque control **32** is piece of metal bent from a substantially U-shaped blank. The torque control **32** is pivotally attached to the metal insert portion of the rod by means of the lobes and flats and the geometry of the torque control. In this embodiment, the torque control **32** is formed from spring steel.

Referring to FIG. **4**, torque control **32** includes a flange **44** and two legs **46**. The flange **44** is longitudinally extending and has two spaced holes **48**. A plane of the torque control is designated by the flange. The two legs **46** are spaced apart from one another and extend from the edge of the flange **44** at opposite ends thereof.

Referring to FIG. **5**, each of the legs **46** has a substantially elliptical cross-sectional shape. The cross-sectional shape includes a first sidewall **52**, a second sidewall **54**, an upper concave portion **56**, a lower concave portion **58**, an angled portion **60**, and end portion **62**. The first and second sidewalls **52** and **54** are substantially parallel to the flange **44** and spaced from one another. The upper portion **56** is curved and connects the first and second sidewalls. The lower portion **58** is curved toward the first sidewall **52**.

The angled portion **60** extends outwardly at an angle from the flange **44** to the first sidewall **52**. The end portion **62** extends from the free end of the lower curved portion **58**. The end portion **62** is substantially parallel to the flange **44**. The free end of the end portion **62** is spaced from the angled portion **60** leaving a gap represented by the arrow g.

In other embodiments, the angled portion **60** and the end portion may be eliminated and the design of the control modified in order to be used with different visor body geometries.

A channel **64** is formed through each elliptical leg, between the first and second sidewalls. The distance between these sidewalls is represented by the arrow d. The torque control should be formed to operate as a functional hinge, so that the rotational axis of the rod cannot move during use.

Referring to FIG. **4**, the second sidewall **54** of each leg **46** includes an extension **66** longitudinally extending from the inner edges of each second sidewall **54**. The extensions **66** extend between the legs **46**. Each second sidewall **54** also includes a cutout **68** extending inwardly from the outer edges of each second sidewall **54**.

The torque control **42** is cut from a sheet of SAE 1070 or 1095 spring steel with a thickness of from 0.9 to 1.1 mm, and bent to the desired shape. The material is heat treated to a Rockwell hardness of from 47 to 49. The dimensions of the features are experimentally determined and depend on the predetermined visor system thickness, the rod's dimensions, the material used, and the force requirements. A conventional lubricant should be used. The lubricant should work at high and low temperatures.

Referring to FIGS. **2** and **3**, the guide **34** has a substantially H-shaped cross section. The H-shaped guide **34** includes a first leg **70** joined to a second leg **72** by a cross bar **74**. The guide in another embodiment can be a T-shaped extension. The first and second legs are spaced and parallel to one another. The free end of the second leg **72** is attached to the base **44** of the torque control **32** using conventional fasteners (not shown), such as rivets. The fasteners extend through the holes **48** in the torque control. The guide **34** is formed by injection molding from nylon or other suitable plastics.

Referring to FIG. **2**, the visor body **26** includes a channel **76**, a bore **78**, a cutout **80**, a pin **82**, a slide track **84**, and a projection **86**. The visor body **26** is substantially rectangular with the channel **76** longitudinally extending along a portion of the top edge of the visor body. When cloth or the like (not shown) is wrapped around the visor body the channel **76** is enclosed.

The bore **78** extends longitudinally through the upper portion of the visor body between the channel **76** and the front edge **88**. In this embodiment, the bore **78** is formed by a conventional arrangement of a plurality of curved arms **90**. The arms **90** alternately form lower and upper curved surfaces of the bore. During movement of the visor body between the stored and lowered positions the arms **90** act as a hinge. The bore **78** is dimensioned such that the visor body **26** slides smoothly over the rod **30** during lateral movement of the visor body.

The cutout **80** is U-shaped and formed within the top edge of the visor body **26** between the channel **76** and the rear edge **92**. The pin **82** extends longitudinally across the cutout **80**. Referring to FIG. **1**, the vehicle **10** includes a bracket (not shown). This bracket is located adjacent the windshield **12** and spaced from the elbow bracket **28**. When the pin **82** is secured within the bracket (not shown) the visor **26** is retained along the windshield **12** either in the stored position or the lowered position.

Referring to FIGS. **2** and **3**, the slide track **84** is integrally formed on the upper surface **94** of the visor body. The slide track **84** includes a first vertical wall **96**, a second vertical wall **98** spaced from the first vertical wall **96**, a horizontal wall **100**, and an opening **102**.

The first and second vertical walls **96** and **98** extends from the upper surface **94** of the visor body. The horizontal wall **100** joins the first and second vertical walls **96** and **98**. A ridge **104** extends from the first vertical wall **96** The horizontal wall **100** is substantially parallel to and spaced from the surface **94** of the visor body, so that substantially enclosed passage **106** is formed therebetween. The surface **94** of the visor body may be the back of a mirror frame assembly in some applications. The passage **106** extends longitudinally along a portion of the visor body adjacent the surface **94**. The passage is shaped to receive a portion of the guide **34** in a sliding engagement. The horizontal wall **100** includes a partially longitudinally extending slot **108**.

The opening **102** is formed at the free end of each of the walls. The walls are shaped so that they are angled at the opening **102** thus forming lateral and vertical lead-ins into the passage.

The projection **86** extends from the upper surface **94** of the visor body. The projection is wedge shaped angled upwardly from the rear edge **88** toward the forward edge **92**. Thus the projection **86** includes a vertical surface **110**, which is aligned with the opening **102** of the track **84**.

The visor body and all of its components may be integrally injection molded from ABS plastic or other suitable plastics that have the appropriate properties for an automotive environment.

Assembly will now be discussed with reference to FIGS. **2** and **3**. The guide **34** is inserted into the track **84**, so that the first leg **70** is within the passage **106**. The angled free ends of the track walls guide the guide **34** into the passage **106** vertically and laterally. The rod **30** is then inserted through the visor body bore **78**. Thus, the rod **30** extends into the channel **76**. The metal insert **36** is passed through the channels **64** of the torque control **42** (as shown in FIGS. **4** and **5**) until the lobe (not shown) is between the legs **46** in